



# Annual Index of Articles: 1990

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## ART

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**The Sculpted Beam:** Describes how artist Lynn Olsen used fiber cement to create a sculpture of an extruded aluminum beam. 2 pp; 90:46

## BARRIER WALLS

**Hollow Polystyrene Blocks Form Concrete Walls:** Interlocking hollow blocks of expanded polystyrene are assembled to make stay-in-place formwork for barrier walls, stepped footings, basements, and other foundation walls. Lightweight blocks can be cut to form curved and zigzag walls, with ornamental details added in precut polystyrene shapes. Surface can be finished with stucco, brick, or wood. 3 pp; 90:557

## BRIDGES

**Bridges and Our Environment:** Guest editorial on the impor-

ance of bridges in our functional and aesthetic environment. 3 pp; 90:942

**Prestressed Concrete for Short-span Bridges:** Describes eight typical precast prestressed girder and beam cross-sections suitable for bridge spans up to 100 feet. Dimensions and optimum spans are tabulated. Case studies of actual bridges show local installation details. 5 pp; 90:607

**Short-span Arch Bridges:** Short-span arch bridges are aesthetically appealing and structurally efficient but often costly to form. Precasting and inflated forming methods to cut costs are described. Construction sequence for one precast system is shown. 4 pp; 90:624

## COATINGS

**How to Cure a Concrete Floor Before Coating It:** Overview of floor curing methods and which to choose if a coating is to be applied. 2 pp; 90:368

**Protective and Decorative Coatings: An Updated Catalog:** An extensive update of the author's May 1981 article listing types of coatings and their capabilities and limitations. 6 pp; 90:352

**Specifying and Applying Coatings for Water and Wastewater Treatment Facilities:** Covers exposure conditions, application methods, surface preparation, inspection, and maintenance of coatings for water and wastewater facilities. 4 pp; 90:384

## COLD WEATHER CONCRETING

**Designing Cold Weather Concrete Mixes:** Adjust mix ingredients or proportions to reduce the days of cold weather protection needed, thus reducing costs. Use accelerators (Type C or E), add an extra 100 pounds of cement per cubic yard, use Type III cement, or heat the mix water. 3 pp; 90:882

**Enclosures Keep Workers Warm—and More Productive—in Cold Weather:** Describes enclosures for frame attachment, prefabricated modular panel systems, tents, and tensioned fabric enclosure systems. 4 pp; 90:857

**Using Heaters Safely:** Describes ventilation requirements and lists guidelines for using indirect and direct-fired heaters. 3 pp; 90:878

## CRACKING

**Evaluating Concrete Cracking by Measuring Crack Width:** Describes how to use an optical comparator to measure crack widths and judge seriousness of a cracking problem. 3 pp; 90:553

**Reading Structural Concrete Cracks:** When tensile stress exceeds the tensile strength of the concrete, cracking occurs. Learn how tensile, compressive, and flexural stresses affect cracking. Many diagrams included. 6 pp; 90:994

## DESIGN

**Design for Constructability: A Contractor's View:** Making structures easier to build lowers costs and improves quality. Suggests how engineers and architects can design for constructability. 3 pp; 90:209



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## EARTHQUAKE RESISTANCE

**How Concrete Fared in the California Quake:** Explains why many modern concrete buildings weren't damaged in the October 1989 Loma Prieta quake. Compares quake with Armenia's and Mexico City's quakes. 4 pp; 90:203

**No-downtime Seismic Retrofit:** Contractors install seismic isolators on columns, strengthen frame, and isolate elevator core while building stays in round-the-clock operation. 4 pp; 90:843

## EQUIPMENT

**Flatter Slabs at Lower Cost:** Truss-type vibratory screeds can produce flatter slabs at lower prices than manual screeding. Describes how to use the equipment. 3 pp; 90:698

**Hydraulic Cutter Strips Pile Heads in Minutes:** Describes how a pile head cutter cuts a pile head off levelly and carries away debris in less than 5 minutes for each pile. 2 pp; 90:230

**Modified Loader Places 7-ton Precast Panels With Only 3 Inches of Headroom:** An Arizona contractor, building an underground section of I-10 through Phoenix, modified a wheel loader with a customized strongback to pick up and place 7-ton precast concrete panels against the tunnel walls with only 3 inches of headroom. 2 pp; 90:378

**Riding Trowels:** Riding trowels provide higher productivity than walk-behind trowels, especially for slabs greater than 3,000 square feet. Overlapping blade models increase productivity up to 30% because you don't have to go back over the ridge formed by nonoverlapping blades. 4 pp; 90:703

**Water-source Heat Pump Economically Controls Concrete Temperature:** An Alabama contractor saves money with a system that cools and heats batch water. 2 pp; 90:234

## EPOXY INJECTION

**Concrete Bonding Process Saves Badly Cracked Dome Roof:** The cracks in the domed concrete roof at the Highland Creek Treatment Plant in East Toronto, Canada, were repaired in less than 3 months using epoxy injection. 2 pp; 90:939

## EXPOSED AGGREGATE

**Tips on Producing Exposed Aggregate Flatwork Finishes:** Seeding is the most common way to produce an exposed aggregate finish. Gives tips on selecting and preparing the aggregate; preparing the base slab; seeding, embedding, and exposing the aggregate; curing and sealing; and jointing. 4 pp; 90:689

## FIBER REINFORCEMENT

**High-volume Polypropylene Reinforcement for Shotcrete:** Collated, fibrillated polypropylene fibers were used at a dosage of 10 pounds per cubic yard (0.66% by volume) to reinforce the shotcrete tunnel lining of Oldman River Dam, Alberta, Canada. 2 pp; 90:33

## FLATWORK

**A Concrete Sidewalk Primer:** Presents the basics of building concrete sidewalks. Prepare subgrade and use adequate thickness and good-quality concrete. 4 pp; 90:720

**Avoiding Common Outdoor Flatwork Problems:** Using the right mix and construction methods prevent surface defects in concrete. Covers how to reduce or prevent shrinkage cracks, craze cracking, settlement, surface scaling, and popouts. 4 pp; 90:632

**Award-winning Plaza and Walkways Combine Intricate Jointing With Multiple Colors and Textures:** A 7,100-square-foot walkway in Creve Coeur, MO, displays an intricate geometry using diagonally scored joints across fields that intersect with joints across bands dividing the field. 2 pp; 90:373

**Concrete Stairway Makes Grand Entryway to Beach:** Describes construction, design, and cost of cast-in-place stairs leading to a beach in Montecito, CA. Studded with boulders and stones, the stairs blend with the site. 2 pp; 90:574

**Flatwork Forming is a Snap Using Plastic Formwork System:** This plastic flatwork forming system lets you tear down and set up fast. It makes inside or outside radiuses as tight as 5 feet and also can be used with wood forms. 2 pp; 90:227

**Stamped Concrete Flatwork:** Pictorial describes advantages, costs, and tools. Focuses on flatwork job at Chicago's North Pier. 5 pp; 90:783

## FORMWORK

**Fast-tracked Concrete Hotel:** Four hundred hotel rooms, each with a 30° bend in the side walls, were fast-tracked using a tunnel forming system. Heated curing helped assure progress at the rate of four guest rooms every 24 hours. Rigid U.S.-made forms delivered surfaces smooth enough for direct application of vinylized wall coverings. 3 pp; 90:460

**Prestressed Concrete Egg-shaped Sludge Digesters:** The world's largest egg-shaped digesters at a Bottrop, Germany, wastewater treatment plant are 149 feet tall. The self-supporting, custom-designed formwork system permits concrete placement without ties, bolts, or other wall penetrations. 2 pp; 90:19

**Rolling Box Culvert Forms Provide 1-day Cycle Time:** A box culvert traveler, a retractable, rolling three-sided form, is cost-effective if you're hand-forming more than 200 feet of culvert. It can allow a 1-day cycle time for as much as a 40-foot length. Describes how to use. 3 pp; 90:619

**Self-lifting Forms Shape Building Cores:** Self-lifting forms for high-rise concrete cores consist of ganged panels hung from a framing grid supported by completed construction. The system, which uses hydraulic rams to raise the forms, also provides work platforms inside and outside the building's core walls. A single crew completes a lift every 2 or 3 days, independent of crane time constraints. 4 pp; 90:215

## HIGH-RISE

**Construction of Elevated Concrete Slabs:** Discusses effects of design and construction methods on slab levelness and elevation control during and after construction. Shows why camber is an inexact method for producing a flat, level floor at the correct elevation. 7 pp; 90:910

**Forming the World's Tallest Concrete-frame Building:** Describes formwork for 311 S. Wacker Dr., a Chicago office building that sets a new height record of 967 feet for all-concrete frames. Using top-down construction for subterranean work permitted the building frame to go up while below-grade levels were being constructed. Flying truss-supported forms barged to the site facilitated 4- and 5-day construction cycles. 5 pp; 90:11

## HISTORY AND HERITAGE

**The Kahn Reinforcing Bar:** Julius Kahn, the brother of famous architect Albert Kahn, developed the first reinforcing bar that obtained monolithic action with concrete. 1 p; 90:480

## HOT WEATHER CONCRETING

**Hot Weather Concreting Tips:** Provides extensive checklists of suggestions for placing concrete in hot weather. Tips cover production, delivery, and discharge; placing and finishing; curing; and testing and inspection. 4 pp; 90:541

## HYDRONIC HEATING

**In-slab Hydronic Heating Systems Warm Rooms Indoors, Melt Snow and Ice Outdoors:** Flexible tubing makes newer systems easier to install. Describes how to install systems, how they work, and shows how system cut heating costs by 15% for a home in Minnesota. 4 pp; 90:851

## LANDSCAPING

**Concrete Hardscape Revitalizes Plymouth, England:** Award-winning concrete hardscape converts the center of Plymouth, England, to a delightful pedestrian mall. A concrete-based sunial more than 30 feet high accents the main intersection and colorful concrete pavers and other precast units define walking and seating spaces. 3 pp; 90:475

(more)



## LEGAL

**Contractors Liable for Employee Acts:** When you hire an employee with a violent or dishonest history, you are responsible for making sure that your employees and clients are not at risk from that person. 1 p; 90:649

**How to Choose a Lawyer:** Lawyers, like many contractors, have specialties. Recommends setting up an interview and asking the 10 questions listed. 1 p; 90:572

**How to Survive a Deposition:** How contractors should behave and what they should expect during a deposition. 2 pp; 90:1004

**Rent-a-judge:** Retired judges are qualified dispute arbitrators. 1 p; 90:395

## LISTS

**Buyer's Guide:** A list of products and the companies that make them. Also includes addresses and telephone numbers of companies. 77 pp; 90:1025

**Concrete Construction Subject Index: 1989:** Listing of 1989 articles in *Concrete Construction* arranged by subject. 12 pp; 90:108

**Concrete Industry Organizations:** Lists addresses and telephone numbers of concrete industry organizations. 8 pp; 90:1110

**Directory of Specialized Concrete Evaluation and Testing Services:** Lists addresses, telephone numbers, and types of work done by concrete testing and evaluation services. 11 pp; 90:326

**Parade of Popular Products:** Includes a list of the most responded-to product items appearing during the year. 12 pp; 90:1123

## MANAGEMENT

**Can Your Company Live Without You—and Should It?:** If you die or are disabled, what will happen to your construction company? Describes ways to set up plans for when you aren't there to guide the business. 2 pp; 90:647

**Choosing the Right Equipment Rental Vendor:** Lists tips for choosing a rental vendor. 2 pp; 90:650

**Computerize Carefully:** Computerizing takes at least two times as much money and time as originally estimated. Suggests how to make the transition easier. 1 p; 90:314

**Construction Industry Needs 210,000 New Workers Each Year:** Statistics from the Associated General Contractors of America show that work force shortages threaten the construction industry. 2 pp; 90:566

**How a Lender Evaluates You:** Proving to a lender you're a good risk takes time and organized financial statements. Also lists questions to ask when choosing a lender. 1 p; 90:393

**How to Control Equipment Costs:** Equipment costs need to be charged to projects correctly or you won't know if a job is profitable. Charge maintenance and replacement costs each month. 3 pp; 90:58

**How to Get Paid in Full and On Time:** You can get paid in full and on time by letting the owners/designers know upfront that the payment clause must be followed. Contractors must send bills on the first of the month and avoid retying payment requisitions that are changed by designers. 2 pp; 90:237

**Is Your Working Capital Turnover OK?:** Shows you if your ratio of net revenues to working capital is making you miss profits. 1 p; 90:573

**Planning for Success Brings Success to an Indiana Contractor:** Indiana concrete contractor Travis Gloyd keeps his company successful by writing and annually updating a 5-year business plan. He keeps ahead with productive equipment, concreting methods, and management techniques. 3 pp; 90:39

**Strategic Planning for Contractors:** Changing economic conditions make it essential for contractors to have a business plan. Describes how to come up with one and costs. 7 pp; 90:1010

## MARKETING

**Concrete Pavements Save Truck Fuel:** Trucks can save up to 2 miles per gallon by driving on concrete instead of asphalt, even when the pavement surfaces are similar in roughness. FHWA study done in 1982. 1 p; 90:67

**Pictures Provide Powerful Publicity:** A contractor's guide to taking jobsite pictures for publication. 4 pp; 90:933

**Win More Concrete Work With Color:** Contractors can increase work volume by developing skills with colored concrete and promoting to landscape architects. More than 120,000 square feet of colored and textured concrete at the Grand Floridian resort in Orlando resulted from teamwork among the color manufacturer, concrete contractor, and landscape planner. 4 pp; 90:466

## NOTABLE STRUCTURES

**Concrete Garage Serves Postal Trucks on Four Levels:** A four-level cast-in-place garage for the U.S. Postal Service was built on a tight site in Manhattan. The 3x3-foot beams, spanning 64 feet between columns, support a 6-inch slab—all designed to meet Seismic Zone 2 requirements. 2 pp; 90:433

**Concrete Giant Rises on Chicago Skyline:** At 967 feet (70 stories), 311 S. Wacker Dr. in Chicago sets a new height record for all-concrete buildings. The shear wall and interactive frame structural system were built with 110,000 cubic yards of 6,000- to 12,000-psi, pumped concrete. 4 pp; 90:5

**Concrete Structure Supports Ecology Research Center:** Biosphere II, a 3-acre, self-contained habitat for ecological research, rests on a concrete base built to tight construction standards for a 100-year service life. Precisely located embedments in architectural-quality concrete were required for attachment of steel liner plates and support of the space-frame superstructure. 5 pp; 90:425

**Record-setting Concrete:** Overview of current concrete structures that are record-setters, such as world's highest concrete structure (CN Tower in Toronto) and highest-strength ready mixed concrete (Two Union Square in Seattle). 2 pp; 90:24

**SkyDome Structure Cast in Place:** The Toronto SkyDome is the world's first multipurpose stadium with a retractable roof. The support system consists of 48 reinforced concrete bents. All other structural elements are concrete except for the retractable roof and movable bleachers. 3 pp; 90:449

## OVERLAYS

**Fast-track Bonded Overlays:** Bonded overlays are a cost-effective, long-term solution to improving the structural capacity and rideability of existing concrete pavements. Tells how to install and joint bonded overlays. 7 pp; 90:979

## PARKING STRUCTURES

**Durability Systems for Post-tensioned Concrete Parking Structures:** Placing concrete with a redundant durability system protects parking structures. Use high-quality concrete, adequate drainage, surface sealers, joint sealants, adequate rebar cover, epoxy-coated reinforcing steel, corrosion inhibitors, and post-tensioning protection. 4 pp; 90:533

**Selecting and Applying Traffic-bearing Membranes for Parking Garages:** Defines the difference between traffic-bearing membrane (100% protection) vs. sealers. Explains how to apply and cure membrane and how to determine the moisture condition of concrete. 3 pp; 90:545

## PRECAST

**Precast Pedestrian Bridges Keep Park Picturesque:** Three precast pedestrian bridges in Kil-Kona Park, Winnipeg, Manitoba, Canada, use 12 arch panels cast from one form. Schedule wasn't critical, so contractor worked in spring and winter—taking advantage of lower winter precasting costs and lower spring welding costs. 2 pp; 90:64

## PROBLEM CLINIC

**Problem Clinic: January (4 pp; 90:70)**  
• Bracing for Column Forms

- Graphite Shear Connectors for Sandwich Panels
- Yield Loss in Tall Walls
- Joint Detail Where Asphalt Pavement Meets a Concrete Slab
- Blistering in Heated Enclosure
- Graphite Form Ties

**Problem Clinic: February (1 p; 90:240)**

- Will Calcium Chloride Thaw a Frozen Subgrade?
- Epoxy Specifications for Crack Injection

**Problem Clinic: March (1 p; 90:316)**

- Using Two Courses of Concrete to Place Welded Wire Fabric
- Air-entrained Concrete Can Be Troweled

**Problem Clinic: April (1 p; 90:376)**

- Chain Drag Delamination Surveys

**Problem Clinic: May (2 pp; 90:482)**

- Making a New Bridge Capture an Old Look
- Concrete Topping for Cellular Concrete

**Problem Clinic: June (3 pp; 90:562)**

- Cast Stone Differs from Precast Concrete
- Curing Cylinders by Immersion in Water
- Onsite Mixers and False Setting

**Problem Clinic: July (3 pp; 90:640)**

- What's This New ACI Building Code?

**Problem Clinic: August (2 pp; 90:726)**

- Subbases Not Needed Beneath Most Concrete Streets and Low-volume Highways
- Remove Curing Compound Before Placing an Overlay

**Problem Clinic: September (2 pp; 90:799)**

- Magnets Hold Formwork Blockouts

**Problem Clinic: October (1 p; 90:885)**

- Poor Finish on Parking Structure Slabs

**Problem Clinic: November (2 pp; 90:948)**

- Bond Breaker Forgotten on Tilt-up Job?

**Problem Clinic: December (1 p; 90:1022)**

- Finish required for floor to receive a polyurethane coating
- Can 4x8-inch cylinders be used for producer's standard deviation determination?

## REINFORCEMENT

**Practical Shear Reinforcement for Concrete Flat Slabs:**

Large-head studs welded to a steel strip can be used as shear reinforcement in two-way slab systems. They're more effective than shear heads or stirrup cages and more cost-effective than forming around drop panels or column capitals. 2 pp; 90:223

## REPAIR

**A Unique Way to Repair Flat Plates:** The balconies of a Florida high-rise were repaired by drilling holes in them for added reinforcement. The top rebar had been placed too low to support the flat plates. Polyester resin cartridges sealed the new 16- to 19-foot #10 bars into place. 4 pp; 90:298

**Leave Existing Manholes in Place—Install Movable Curbs:**

Two people from Ohio Bell invented a movable curb so utility workers can easily remove the curb to gain access to manholes. The curb, including labor, costs \$2,000—that's 25 times less than the cost of relocating a manhole. 1 p; 90:68

**Transverse Joint Drain Helps Prevent Slab Pumping Damage:**

A transverse drain system allows retrofit installation of slotted drain pipe in pavement subbase beneath water-entry points without interrupting traffic. Special ground-piercing tool bores a tunnel in the subbase and pulls drain behind it. 3 pp; 90:643

## RESIDENTIAL

**Aluminum Forms for Affordable Housing:** Hand-set aluminum forms allow workers to cast house walls, partitions, and roof in a single pour. Builder's package includes formwork, architectural and engineering drawings, and onsite training for workers to erect houses or apartments. 3 pp; 90:709

## SAFETY

**Saving Lives With Lockout/tagout:** Follow checklist for pre-

venting accidental movement or operation of equipment when it could endanger workers. 2 pp; 90:728

## SHORING

**Adjustable Shoring Systems:** Describes types, safety, and how they work: modular and factory-built shoring systems of steel or aluminum, some with wood components. Includes single post shores, scaffold-type frame shoring, horizontal shoring, flying truss systems, column-mounted shore brackets, and friction collars. 7 pp; 90:921

## TESTING

**Petrography Reveals Parking Ramp Problems:** Popouts were unexpected in a northeastern Minnesota parking ramp so owners took concrete cores for petrographic analysis. Not only was there shale in the aggregate but three serious problems with the concrete were found. Points out value of petrographic testing before deterioration occurs. 3 pp; 90:306

**Tightness Tester Aids Quality Control Investigations:** A non-destructive instrument helps investigators determine the relative tightness of a concrete surface by applying a vacuum pressure. 2 pp; 90:794

## TILT-UP

**Huge, Asymmetrical Tilt-up Panels Challenge Contractor Ingenuity:** The Barranca Court office buildings in Irvine, CA, required care in planning and pre-staging because of unusual panel shapes and a restrictive site. 3 pp; 90:549

**Rigging for Tilt-up:** After a computer determines the location of lifting inserts in tilt-up concrete panels, site personnel should coordinate panel layout with the erector's plans for rigging and panel erection to efficiently use crane. Consider rigging configuration, sling length, crane location, and plumb setting techniques. 4 pp; 90:863

## TOLERANCES

**Someone Still Has to Pay When Building Components Don't Fit Even if Tolerances Are Met:** Describes five projects where tolerances are met but the buildings don't work. Contractors should anticipate tolerance problems and owners should pay for tighter tolerances. 4 pp; 90:50

## TUNNEL CONSTRUCTION

**Seattle Lid Covers I-90:** The Seattle Lid covered roadway section of I-90 provides a noise barrier and air pollution control. Incorporating Mount Baker Ridge Tunnel, the world's largest-diameter soft-ground tunnel, the Lid is 3,400 feet long, cost \$400 million, and used 290,000 cubic yards of concrete with many precast panels and girders. 3 pp; 90:455

## WALL PANELS

**Welded Wire Sandwich Panels: An Alternative to Wood-frame Construction:** Welded wire sandwich panels are installed to be self-supporting or as a cladding on metal-frame construction. Photos show how it's used and installed. 3 pp; 90:363

## WHITETOPPING

**Whitetopping a Residential Driveway:** A 3½-inch layer of new concrete covers a deteriorated asphalt driveway, providing a needed upgrade for a 30-year-old home. The mix, its placement, and joint details are described and pictured. 4 pp; 90:685

**Whitetopping Renovates Los Angeles Fair Complex in 40 Days:** The asphalt floors and parking lots of four exhibit buildings of Fairplex, Pomona, CA, were whitetopped with 140,000 square feet of concrete in 40 days. Polypropylene fibers, pattern stamping, and sandblasting were used. 2 pp; 90:716

**Whitetopping—The Right Choice:** In 1977, Iowa's Washington County whitetopped an old asphalt pavement. It still looks great and no maintenance dollars have been spent on it. Describes how resurfacing with concrete rather than asphalt saved money—little road preparation was needed. 1 p; 90:947

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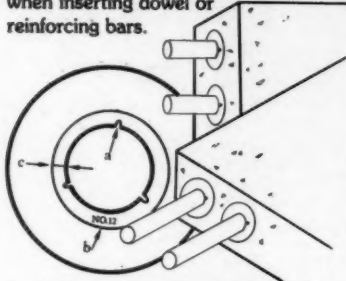
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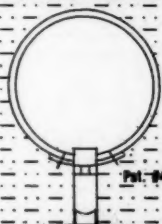
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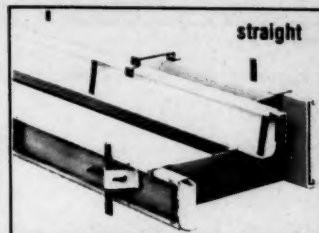
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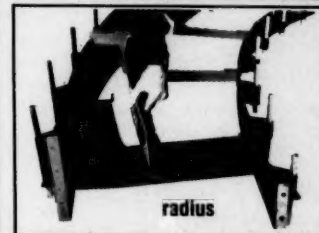
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